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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,232	03/12/2004	Nan-Hsiung Yeh	STL11732	7555

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Kirk A. Cesari
Seagate Technology LLC
Intellectual Property Dept. - SHK2LG
1280 Disc Drive
Shakopee, MN 55379-1863

EXAMINER	
CHAUDRY, MUJTABA M	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,232	YEH ET AL.	
	Examiner	Art Unit	
	Mujtaba K. Chaudry	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 10-20* is/are rejected.

7)☒ Claim(s) *6-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/12/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-20 are presented for examination.

Information Disclosure Statement

All the US patent documents listed in the information disclosure statements (IDS) submitted March 12, 2004 were considered. The foreign patent documents were not provided and therefore not considered. See 37 CFR 1.97.

Oath/Declaration

The Oath filed March 12, 2004 complies with all the requirements set forth in MPEP 602 and therefore is accepted.

Drawings

The drawings submitted March 12, 2004 are objected to because:

- Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed

of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

- Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Appropriate correction is requested.

Specification

The specification is accepted.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10799231. Although the conflicting claims are not identical, they are not patentably distinct from each other. For example, claims 1 and 2 of the copending application teach a method comprising: performing a cyclic redundancy check on each of a plurality of code blocks of a turbo product code (TCP) code word; and assigning an artificially high probability confidence measure to bits of any of the plurality of code blocks which pass the CRC and iteratively decoding the TCP code word between a soft decision algorithm and a TPC decoder. Whereas the

present application teaches to iteratively decode a TCP code word until a CRC condition is satisfied. Essentially one is just an embodiment of the other, wherein both basically teach to iteratively decode a TPC code word based on CRC.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The claim recites, "**a data storage system configured to implement the method of claim 1**." It is indefinite because it is not clear what the data storage system actually includes. **See MPEP 2173.05(p).**

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The claim recites, "**a communication system configured to implement the method of claim 1**." It is indefinite because it is not clear what the communication system actually includes. **See MPEP 2173.05(p).**

Applicants are suggested to amend/cancel claims 12 and 14.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 10, 11, 14-16, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Lavi et al. (herein after: Lavi) USPN 6950977.

As per claim 1, Lavi teaches iteratively decoding a turbo product code (TCP) code word (i.e., abstract); and terminating the iterative decoding when the TCP code word satisfies a cyclic redundancy check (i.e., col. 2, lines 2-3 and col. 4, lines 8-17).

As per claim 2, Lavi teaches, in view of above rejections, decoding the TCP code word using a soft decision algorithm (i.e., Figure 4, reference number 30) and a TCP decoder (i.e., Figure 4, reference number 33).

As per claim 10, Lavi teaches, in view of above rejections, before the step of iteratively decoding the TPC code word, CRC bits are appended (i.e., Figure 6, output of reference number 39 to input of decoder 1, reference number 30).

As per claim 11, Lavi teaches, in view of above rejections, adding a row and column of parity bits to each TPC code block (i.e., Figure 6, parity input of reference number 30).

As per claim 14, Lavi teaches, in view of above rejections, a communication system to implement the decoding process (i.e., col. 1, line 15).

As per claim 15, Lavi teaches an iterative decoder configured to iteratively decode a TCP code word (i.e., abstract); cyclic redundancy check circuitry to perform CRC on the TPC code word (i.e., Figure 4, reference number 36); terminate decoding when the TPC code word satisfies the CRC (i.e., col. 2, lines 2-3 and col. 4, lines 8-17).

As per claim 16, Lavi teaches, in view of above rejections, decoding the TCP code word using a soft decision algorithm (i.e., Figure 4, reference number 30) and a TCP decoder (i.e., Figure 4, reference number 33).

As per claim 19, Lavi teaches, providing a plurality of TPC code words (i.e., Figure 6, systematic input of reference number 30) and appending cyclic redundancy check to the TPC code words (i.e., Figure 6, output of reference number 39 into input of reference number 30).

As per claim 20, Lavi teaches, in view of above rejection, iteratively decoding the TPC code word (i.e., abstract); and terminating the iterative decoding when the TPC code word satisfies a cyclic redundancy check (i.e., col. 2, lines 2-3 and col. 4, lines 8-17).

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-5, 12, 13 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lavi et al. (herein after: Lavi) USPN 6950977 further in view of Applicants Admitted Prior Art (AAPA).

As per claim 3, Lavi does not explicitly teach, in view of above rejections, the soft decision algorithm is a BCJR algorithm. However, AAPA teaches (i.e., page 1, lines 20-28) soft decision algorithms such as BCJR. Therefore to use BCJR as the soft decision algorithm would be an obvious engineering design choice.

As per claim 4, Lavi does not explicitly teach, in view of above rejections, the soft decision algorithm is a SOVA. However, AAPA teaches (i.e., page 1, lines 27-29) soft decision algorithms such as SOVA typically take the form of log-likelihood values. Therefore to use SOVA as the soft decision algorithm would be an obvious engineering design choice.

As per claim 5, Lavi does not explicitly teach, in view of above rejections, the TCP word with a single parity check. However, AAPA teaches (i.e., page 1, line 20) the TCP word with a single parity check (TCP/SPC). Therefore to use TCP/SPC would be an obvious engineering design choice.

As per claim 12, Lavi does not explicitly teach a data storage system. However, Lavi substantially teaches, in view of above rejections, (col. 1, line 15) error detection and correction for digital communications. It is well known in the art for a data storage system to utilize error detection and correction schemes since it is a form of digital communication.

As per claim 13, Lavi does not explicitly teach, in view of above rejections, the TCP word to be 512 bytes. However, AAPA teaches (i.e., page 1, line 18) the TCP word with 512 bytes. Therefore to use 512 byte TCP word would be an obvious engineering design choice.

As per claim 17, Lavi does not explicitly teach, in view of above rejections, the soft decision algorithm is a SOVA. However, AAPA teaches (i.e., page 1, lines 27-29) soft decision algorithms such as SOVA typically take the form of log-likelihood values. Therefore to use SOVA as the soft decision algorithm would be an obvious engineering design choice.

As per claim 18, Lavi does not explicitly teach, in view of above rejections, the TCP word with a single parity check. However, AAPA teaches (i.e., page 1, line 20) the TCP word with a single parity check (TCP/SPC). Therefore to use TCP/SPC would be an obvious engineering design choice.

Allowable Subject Matter

Claims 6-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additional pertinent prior arts are included herein for Applicant's review.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mujtaba K. Chaudry whose telephone number is 571-272-3817. The examiner can normally be reached on Mon-Fri 9-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on 571-272-6962.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mujtaba Chaudry
Art Unit 2112
April 25, 2007